UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/584,796	06/01/2000	Fredrik Lindqvist	1410-679	4990

23117   7590   03/19/2007
NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER
JAMAL, ALEXANDER

ART UNIT	PAPER NUMBER
2614	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
2 MONTHS	03/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 09/584,796
Filing Date: June 01, 2000
Appellant(s): LINDQVIST ET AL.

_____

John Lastova
<u>For Appellant</u>

SUPPLEMENTAL EXAMINER'S ANSWER

This is in response to the reply brief filed 2-15-2007 appealing from the Office action mailed 8-9-2005.

Ressponsive to the reply brief filed on 2-15-2007, a supplemental Examiner's Answer is set forth

below:

In response to the argument (reply brief page 1) that the Ho reference cannot remove

echo due to a previous signal in the frequency domain, examiner notes that all 'current' echoes

are caused by 'previously transmitted' signals. In bidirectional communication links, an echo is

formed when a portion of a previously transmitted signal is reflected back to the

transmitting/receiving device and is combined with the received signal. Examiner again notes

Ho Fig. 3 where echo estimate E(f) is subtracted from the received signal via subtractor 58 in the

frequency domain.

In response to appellant's statement that the examiner has elected not to address the

specific problems of combining Ho, Chaffee, and Dowling (reply brief pages 1 and 2), examiner

contends that the appellant is distorting the facts of this case. The appellant originally argued

that the Ho, Chaffee and Dowling references could not be combined in the arguments filed 6-15-

2005. In the subsequent final rejection filed 8-9-2005, the examiner explained in detail how the

references could be combined (this portion is again cited in the Examiner's Answer under the

Responses to Appellant's Argument B). The examiner described how the combination would

function, and further noted that Dowling (who discloses the precoder) specifically states that the

precoding function can be 'merged' with an echo canceller (Dowling Col 22 lines 1-17). The

examiner offered an explanation in the 8-9-2005 final office action as to how the precoder would

be 'merged' with an echo canceller. The examiner then requested appellant to offer any other

alternate explanation as to how the precoder would be 'merged' with an echo canceller as per

Dowling and **not** read on appellant's claims. Examiner contends that the precoder would be implemented in the same manner as the 'encoder 12' disclosed in Ho Fig. 3. Appellant has offered no alternate explanations in response to examiner's request. Examiner contends that the appellant's problems with combining the Ho, Chaffee and Dowling references have been addressed.

In response to appellant's arguments that the examiner is making the assumption that the transmission channel is the same as the echo channel, the examiner strongly disagrees. The function taught by Dowling is a specific form of encoding a signal before it is transmitted (precoding). The encoding takes into account the ISI and ICI of the channel. When the Dowling encoder is implemented in the Ho system, it must be implemented at the 'encoder 12' block (Ho Fig. 3) in order for the echo canceller disclosed by Ho to function correctly. Note that the **encoded** signal is sent to the echo estimation stage 100 of Ho (Fig. 3). This is because an echo canceller must know what the outgoing signal is in order to be able to estimate the echo. The function of the echo estimation stage 100 is to estimate the 'echo channel'. When Dowling's precoder is implemented in the encoder stage of Ho, then the outgoing signal will take into account the ICI and ISI of the transmission channel. When the encoded signal is sent to echo estimator 100, estimator 100 will estimate the echo channel and use the encoded signal and echo channel estimate to produce an echo estimate (see Ho Col 1 lines 15-45). The echo estimate will be based off signals that take into account the transmission channel. If the signals transmitted (and also fed into the echo path estimator 100 of Ho) take into account the transmission channel ICI and ISI, then the echo estimate will also take into account the effects of the transmission channel that cause ISI and ICI in the echo channel. The echo channel is derived, in part, from

the transmission channel. The whole purpose of the echo canceller stage 100 in Ho Fig. 3 is to estimate what happens to the outgoing signals when they are sent on the transmission channel, that estimate is an estimate of the echo channel. The echo channel is based on both the outgoing signal properties and the transmission channel properties. If the outgoing signals are resistant to transmission channel ISI and ICI, then the echo estimate is resistant to the echo channel ICI and ISI in order for the canceller to function correctly. Dowling already contemplates this when he states that the precoder may be merged with an echo canceller. Furthermore, examiner notes that none of appellant's claims refer to ISI or ICI caused specifically by the echo channel, only that the echo channel estimate takes into account the effects of ICI or ISI (appellant's claims 20-21). The echo estimator 100 of Ho Fig. 3 will take into account the effects of ISI or ICI because it relies on precoded signals (which take into account ISI or ICI) from the Dowling precoder implemented in the encoder stage 12 of Ho.

Furthermore, examiner notes an additional viewpoint for consideration by the board concerning appellant's above argument. It being that the echo canceller of Ho would function to remove all forms of echo. When the echo canceller has 'converged' (Ho Col 6 line 34-49), then the echo canceller will produce the exact echo estimate which is based off the transmitted signals and the echo path. The echo estimate will completely cancel the echo from the received signal. This echo would include echo caused by ISI, ICI or any other echo channel properties (such as an impedance mismatch in the transmission channel). As an example, if carrier A produces 'echo ICI' in carrier B (the 'effects of ICI' of appellant's claim 20), then a converged echo canceller would still see the 'echo ICI' in carrier B as echo, and adaptively estimate and cancel

that echo because the echo canceller is using the originally transmitted carrier B as a reference

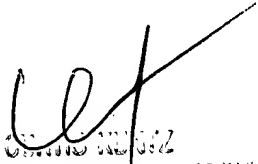(before it is corrupted by echo from any sources).

Appellant may file another reply brief in compliance with 37 CFR 41.41 within two

months of the date of mailing of this supplemental examiner's answer. Extensions of time

under 37 CFR 1.136(a) are not applicable to this two month time period. See 37 CFR

41.43(b)-(c).

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The

examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the

organization where this application or proceeding is assigned are **571-273-8300** for regular

communications and **571-273-8300** for After Final communications.

AJ
March 11, 2007

SINH TRAN
SUPERVISORY PATENT EXAMINER